

Notice of Allowability

Application No.

10/045,110

Examiner

Brett J Buehl

Applicant(s)

JOHNSON, ANDREW

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on 11/30/04.
2. ☒ The allowed claim(s) is/are 1-3, 5-8, 10-13, 15-17, 19 and 21-24, hereinafter renumbered as 1-19, respectively.
3. ☒ The drawings filed on 3/6/02 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 2/15/05.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mark E. McBurney (Reg. #33,114) on 15 February 2005.

The application has been amended as follows:

Title Amendments

2. Please change the title to read: --MICROPROCESSOR FOR EXECUTING SPECULATIVE LOAD INSTRUCTIONS WITH RETRY OF SPECULATIVE LOAD INSTRUCTION WITHOUT CALLING ANY RECOVERY PROCEDURES--

Claim Amendments

3. Claims 4, 9, 14, 18 and 20 should be CANCELED, as they fail to further limit the claims from which they depend.

4. Claim 1, line 4, please INSERT the limitation – from an original position in program order – after the limitation “moving a load instruction”.

5. Claim 1, line 8, please REPLACE the limitation “will execute” with the limitation – executed --.

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6. Claim 1, line 9, please INSERT the limitation – prior to said original position in program order – after the limitation “by speculatively re-executing said load instruction”.
7. Claim 3, line 2, please REPLACE the limitation “information to be retrieved” with the limitation – information retrieved --.
8. Claim 5, line 1, please REPLACE the limitation “claim 4” with the limitation – claim 3 --.
9. Claim 6, line 4, please INSERT the limitation – from an original position in program order – after the limitation “moving a load instruction”.
10. Claim 6, line 7, please REPLACE the limitation “will execute” with the limitation – executed --.
11. Claim 6, line 9, please INSERT the limitation – prior to said original position in program order – after the limitation “by speculatively re-executing said load instruction”.
12. Claim 8, line 2, please REPLACE the limitation “information to be retrieved” with the limitation – information retrieved --.
13. Claim 10, line 1, please REPLACE the limitation “claim 9” with the limitation – claim 8 --.
14. Claim 11, line 5, please INSERT the limitation – from an original position in program order – after the limitation “moving a load instruction”.
15. Claim 11, line 7, please REPLACE the limitation “will execute” with the limitation – executed --.
16. Claim 11, line 10, please INSERT the limitation – prior to said original position in program order – after the limitation “by speculatively re-executing said load instruction”.

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17. Claim 13, line 2, please REPLACE the limitation “information to be retrieved” with the limitation – information retrieved --.
18. Claim 15, line 1, please REPLACE the limitation “claim 14” with the limitation – claim 13 --.
19. Claim 16, lines 4-5, please REPLACE the limitation “moving a load instruction for retrieving information from memory to an advanced position in said program order” with the limitation – moving a load instruction, for retrieving information from memory, from an original position in program order to an advanced position in said program order --.
20. Claim 16, line 7, please REPLACE the limitation “being retrieved” with the limitation – retrieved --.
21. Claim 16, line 9, please INSERT the limitation – prior to said original position in program order – after the limitation “retrying speculative execution of said speculatively executed load instruction”.
22. Claim 17, line 2, please REPLACE the limitation “information to be retrieved” with the limitation – information retrieved --.
23. Claim 19, line 5, please INSERT the limitation – from an original position in said program order – after the limitation “moving said load instruction”.
24. Claim 19, line 10, please INSERT the limitation – prior to said original position in said program order – after the limitation “wherein speculative execution of said load instruction is retried”.
25. Claim 21 should be amended to REMOVE the second period at the end of the claim.

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26. Claim 21, line 6, please INSERT the limitation – from an original position in said program order – after the limitation “moving said load instruction”.

27. Claim 21, line 11, please INSERT the limitation – prior to said original position in said program order – after the limitation “wherein speculative execution of said load instruction is retried”.

28. Claim 23, line 6, please INSERT the limitation – from an original position in said program order – after the limitation “advancing said load instruction”.

29. Claim 23, line 11, please INSERT the limitation – prior to said original position in said program order – after the limitation “wherein speculative execution of said load instruction is retried”.

30. Claim 24, line 6, please INSERT the limitation – from an original position in said program order – after the limitation “advancing said load instruction”.

31. Claim 24, line 12, please INSERT the limitation – prior to said original position in said program order – after the limitation “wherein speculative execution of said load instruction is retried”.

Reasons For Allowance

32. The following is an examiner’s statement of reasons for allowance:

33. Independent claims 1, 6, 11, 16, 19, 21, 23 and 24 (original numbering) move a load instruction to an advanced position, execute the load speculatively and set an indication as to whether the load was successful. At a later moment in time, but before the original position of the load instruction is reached (i.e. still speculative), a check instruction checks the indication to see if the load was successful. If it was not, then the

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speculative load is retried, once again setting an indication as to whether it was successful. The retried load does not call any recovery routines. This differs from the prior art made of record in that the prior art does not retry the load speculatively. Instead, a load check is placed at the original position of the load instruction. The load check instruction retries the load as a normal, non-speculative load, which has normal protection mechanisms (i.e. exception handling, recovery routines).

Conclusion

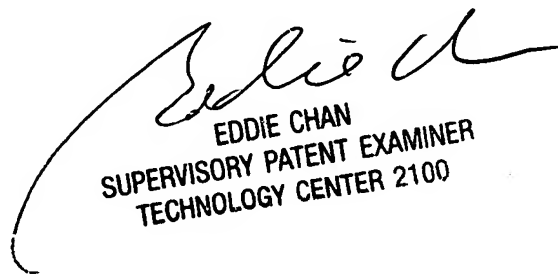
29. U.S. Publication No. 2003/0105942, by Damron et al., made of record and not relied upon, discloses a system with several similar features to the current application. A prefetch instruction, in combination with a speculative load, is used to retrieve the data before it is known if it needed. A second, non-speculative load, is used in the original position of the load, which will load the data without delay if the prefetch was successful. The purpose of the prefetch/speculative load combination of instructions is to hide the memory latency.

30. Inquiries concerning this communication or earlier communications from the examiner should be directed to Brett J. Buehl who can be reached at (571) 272-4161 or <brett.buehl@uspto.gov>. The examiner's normal working schedule is between the hours 9:00am – 6:30pm (EST), Monday – Friday, with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan, can be reached at (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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